



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/542,546

02/18/2006

Henning Sirringhaus

Q89250

6854

23373 7590 08/13/2009  
SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

MAIL DATE

DELIVERY MODE

08/13/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/542,546	<b>Applicant(s)</b> SIRRINGHAUS ET AL.	
	<b>Examiner</b> DAVID S. BLUM	<b>Art Unit</b> 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/31/09.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

This action is in response to the amendment filed 7/31/09. Finality has been withdrawn.

## **DETAILED ACTION**

### ***Specification***

With the amendment to the specification, the objection is hereby withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10, 12-19, 21-22, 32-38, 44-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Sirringhaus et al. (WO 01/46987 cited by applicant).

Regarding claims 1 and 2, Sirringhaus et al., figs. 7(a)-7(c) and related text on pages 10-25 discloses the claimed method for forming on a substrate an electronic device including at least one electrically conductive material and one semiconductive material deposited onto the substrate from respective liquids including the steps of forming on the substrate surface 1 a surface energy pattern that defines a first and second areas 12 spaced apart by a spacing area 10, and a third area of the substrate at least partly overlapping the first, second and spacing areas (fig. 7(a)); subsequently depositing the electrically conductive material (PEDOT) 13 on the substrate to form

source/drain by applying the liquid comprising the electrically conductive material over the substrate (fig. 7(b)); and depositing the semiconductive material 4 (F8T2) on the substrate to form an active island of a transistor by applying the liquid comprising the semiconductor material over the substrate; wherein the surface energy pattern is such as to localize the electrically conductive material to the first and second areas and to localize the semiconductive material to the third area (as the material is placed in the same location as required by the claim limitations, and the body of Sirringhaus as a surface, thus inherently a surface energy and a surface energy pattern, it is clear that the surface energy pattern is such that the electrically conductive material is placed locally as required by the claims); and the semiconductive material is deposited so as to extend over the third area continuously between the conductive material 13 in the first and second areas 12 and cover the whole spacing area (fig. 7(c)).

With respect to claim 3, page 24, third paragraph discloses the step of mechanically rubbing the polyimide layer 10 for a subsequent step of depositing the semiconducting polymer layer 4, therefore, the semiconductor material 4 is attracted more strongly to the spacing area 10 than to the first and second areas 12 which is covered by the conductive material 13.

In regard to claim 4, Sirringhaus teaches the semiconductive material is attracted more to the first and second areas than to the spacing area (page 22 last paragraph).

In regard to claim 5, the pattern includes an area surrounding the first and second areas and the spacing area.

Regarding claim 6, the pattern includes an area surrounding the fourth area.

With respect to claims 7, 8 and 9, see page 22, last paragraph.

With respect to claim 10, see page 23, first paragraph.

In regard to claims 12-13, see page 27.

With respect to claims 14-17, see page 23, third paragraph, Page 26, second paragraph.

Regarding claim 18, the surfaces of the first and second areas are the same.

Regarding claim 19, the first and second areas are formed on an exposed portion of material on the substrate.

With respect to claims 21-22, 32, and 44-47, since the same materials are used, they are inherently having the same characteristics.

Regarding claims 26-29, see page 23, paragraph 3.

With respect to claims 33-34, see page 28, first paragraph, and page 29, last paragraph.

With respect to claims 35-38, see pages 36, last paragraph to page 37, third paragraph.

With respect to claims 48-49, fig. 7(c) shows a further dielectric layer 5 deposited on top of the semiconductor material layer 4.

With respect to claims 50-51, see page 38, third paragraph.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 20, 23-25, 30-31 and 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sirringhaus et al..

Sirringhaus et al., figs. 7(a)-7(c) and related text on pages 10-25 discloses substantially the claimed method for forming on a substrate an electronic device except the channel length, thickness of substrate, and the process temperature; however,

Art Unit: 2813

those limitations are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art as noted in *In re Aller* 105 USPQ 233, 255 (CCPA 1955). One of ordinary skill in the requisite art at the time the invention was made would have selected suitable thickness range, width of space area and temperature range in the process for forming TFT of Sirringhaus et al. in order to obtain the best result.

Regarding claim 20, Sirringhaus does not explicitly teach a lower surface roughness in the first and second areas than in the regions surrounding the first and second regions. However, Sirringhaus does teach treating these areas for different surface effects (hydrophilic/hydrophobic) and without evidence to the contrary, the surface roughness is considered to be a property of this treatment.

In regard to claims 39-43, see page 22 last paragraph. Sirringhaus teaches making areas of the surface hydrophobic or hydrophilic. Although not explicitly teaching repellant or more repellent, or of the same surface energy, this is the result of making areas hydrophobic or hydrophilic. Once it is known to pattern areas for hydrophobic or hydrophilic, it is obvious to do such in other areas.

### ***Response to Arguments***

Applicant's arguments filed 7/31/09 have been fully considered but they are not persuasive.

The applicant acknowledges the different format than suggested in USPTO guidelines.

The applicant argues that Sirringhaus does not teach using surface energy to localize material. However, Sirringhaus does use surface treatments to make the surface either hydrophobic or hydrophilic, and that reads on surface energy. Further, as the material is placed in the same location as required by the claim limitations, and the body of Sirringhaus as a surface, thus inherently a surface energy and a surface energy pattern, it is clear that the surface energy pattern is such that the electrically conductive material is placed locally as required by the claims.

The applicant also argues in regard to what is routine optimization. The examiner holds that dimensions and temperature are of routine optimization.

Applicant's arguments regarding the finality of the previous action, and the previous objection of claims now rejected has been found persuasive. This action is non-final.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is [David.blum@USPTO.gov](mailto:David.blum@USPTO.gov) .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Landau, can be reached at (571)-272-1731. Our facsimile number all patent correspondence to be entered into an application is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David S Blum/

Primary Examiner, Art Unit 2813

August 13, 2009